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Project Development Plan  
for the  
Automated Compensation & Information System (ACIS)

2 July 1981

ACIS	KEY STATUS ITEMS	UNCLASSIFIED
	<ul style="list-style-type: none"> <li>* PROJECT TEAM CHANGES</li>   <li>* REQUIREMENTS DEFINITION STATUS               <ul style="list-style-type: none"> <li>GENERAL FUNCTIONAL REQUIREMENTS</li> <li>DATA AND RESOURCE REQUIREMENTS</li> </ul> </li>   <li>* KEY RESEARCH               <ul style="list-style-type: none"> <li>OUTPUT REQUIREMENTS</li> <li>PAY AND LEAVE ADJUSTMENTS</li> <li>TIME AND ATTENDANCE DOCUMENTATION</li> </ul> </li>   <li>* SCHEDULE               <ul style="list-style-type: none"> <li>GENERAL FUNCTIONAL REQUIREMENTS                      2 OCTOBER 1981</li> <li>DATA AND RESOURCE REQUIREMENTS                      30 NOVEMBER 1981</li> <li>REQUIREMENTS ANALYSIS</li> </ul> </li> </ul>	

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Project Development Plan  
for the  
Automated Compensation and Information System (ACIS)  
(U)

2 July 1981

Prepared by:

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APPROVED BY: \_\_\_\_\_

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PREFACE (U)

The purpose of this project development plan is to define how the ACIS computer system will be developed from initiation through completion. The intent is to ensure that all relevant management and technical issues are fully considered, and that provision is made for an orderly, systematic development of the project. It will also provide management with a control mechanism by enabling and making visible a comparison between planned versus actual project progress.

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EXECUTIVE SUMMARY (U)

This document provides an outline, for both project and higher level management, of the methods and schedule by which the ACIS computer system will be developed. The ACIS project will require significant amounts of manpower and machine resources, and it will be necessary to phase in project deliverables over a period of several years. Thus, this document will be updated periodically, and the information contained herein will be correct only as of the most recent cover-sheet date.

Managing a large developmental project such as ACIS is a routinely complex undertaking, and the use of a proven methodology is a prerequisite for project success. ACIS will utilize a structured methodology based upon the most recent works of Metzger, supplemented where appropriate from other sources. The methodology will guide the project throughout the entire developmental life-cycle. This cycle will consist of the following phases: requirements definition, preliminary and detail design, programming and unit testing, integration and system testing, acceptance testing, installation, and actual operation of the new system. To the extent that outside contractors or commercial packages are used, the phases will be slightly different. At present, ACIS is in the requirements definition phase of the developmental life-cycle.

This document is arranged in ten general categories that includes an introduction and a detailed discussion of the project life cycle. Organizational relationships are also discussed to ensure that normal inter-component coordination is achieved. Details are provided on the approach to product testing at various stages of completion, as well as on the proposed independent quality assurance program. A convenient listing of all formal project documentation is provided, and will be maintained in a current fashion available for management review. Training activities will be given a high level of visibility because of its importance to ultimate developmental success and customer satisfaction. A series of formal and periodic management reviews is also provided to enable management to exercise the appropriate level of control given the eventual size of the project. Finally, the document discusses actual operation of the system and provides specifics on the resources, deliverables, and target completion dates.

At present, activity can only be scheduled through 2 October 1981 because the resources required to develop ACIS have not been finalized by management. A major decision needs to be made as to whether the project will be developed entirely in-house, or by contractor personnel. Another decision relates to the advisability of using a commercial payroll package. These decisions will be made by the 2 October date at which time it will be possible to schedule activities a greater distance into the future.

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1. INTRODUCTION (U)

1.1 BACKGROUND (U)

This plan will provide specific information for both management and the project development team. This plan identifies:

- o The products to be developed.
- o The development resources required
- o Schedules for formal progress review.
- o Internal project milestones.
- o Product phased-delivery milestones.
- o Organizational relationships.
- o Reporting relationships. (U)

This plan will be executed and the system implemented by following the methodology defined by Philip W. Metzger in his book "Managing a Programming Project". The methodology will be modified, where necessary, to meet our unique needs. It will also be supplemented where appropriate from other sources (e.g. FIPS PUB 38 and the work of Burrill and Ellsworth from their book on Modern Project Management). (U)

It should be noted that this document is designed to be a planning tool. As such, it charts a high-level path for both immediate and long-term development. A supporting document, known as the Detail Work Plan (DWP), is also used by project management, but at the day-to-day working level in which tasks are scheduled and individually assigned in a finely detailed manner. The DWP is mentioned only for purposes of reference, and is not included within the PDP. Both the PDP and the DWP will be modified and updated as appropriate to meet the dynamic requirements of the system development process. (U)

1.1.1 CURRENT PAYROLL (P/R) SYSTEMS (U)

The payroll function within the Agency has been divided into four distinct payroll systems. These are as follows:

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- o The automated Biweekly Payroll system which pays [REDACTED] percent of all persons employed by the Agency.

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- o CIA Retirement and Disability System (CIARDS) pay system.
- o Joint Publications Research Service (JPRS) pay system.

Detailed discussions of each of these four systems may be found in the Functional Requirements Document (FRD). The Biweekly payroll system's basic functions are described below in some detail because it is the most important system, and because all of the Agency's payroll systems possess these same basic functions to some extent. Brief overviews of the remaining three payroll systems are also provided to draw the important distinctions between the Biweek system and the three remaining systems. (S)

#### 1.1.2 BIWEEKLY PAYROLL OVERVIEW (U)

The current biweek P/R system was first put into use in 1973, and has undergone significant modification during the subsequent 8 years. The primary function of the biweek system is to pay Agency employees. (U)

It pays employees on the basis of hours worked, and it does so within the strict confines of the normal two week payroll processing cycle. The system performs a routine but critical function. If serious system problems develop, the impact can potentially have Agency-wide ramifications within a short period of time. (U)

The system is comprised of seven major modules which are as follows:

- o Time & Attendance input processing
- o Master file update
- o Final Review/Corrections
- o Pay computation
- o Reporting/history
- o Actual payments
- o Year-end processing. (U)

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1.1.2.1 Time & Attendance Input Processing (U)

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The Agency time and attendance record (T&A) is used to record regular hours in pay status, hours for additional compensation, and leave hours used.

cards are manually processed by Compensation Division every two weeks. This is considered to be an unsatisfactory aspect of the system. In addition to the obvious inefficiencies, there is a growing risk that extensive manual processing may overwhelm the users with predictable consequences for the timely compensation of Agency employees. (S)

After keypunching, the T&A data is run through an edit process. Edit reports are produced and provision is made for user corrections as necessary. Additional processing occurs which, among other things, identifies missing and duplicate T&As. The appropriate reports and opportunities for correction are provided at this point. (U)

1.1.2.2 Master File Update (U)

The master file contains all of the basic information with which the payroll system is concerned such as employee name, employee number, pay grade, types of deductions, etc. There are over 200 separate data items in the master file. It is the most important file in the system and it is extremely sensitive in that it identifies essentially every employee in the Agency. The data items contained in this file are defined by certain data identification codes. Maintenance is performed on this file by using another separate set of codes known as transaction codes. (C)

Updates to this file can originate from a number of different sources, and they are accomplished either mechanically or manually. Update sources include:

- o Office of Personnel (PERSIGN system)
- o Compensation Division

- o Insurance Branch
- o Credit Union
- o Voluntary Investment Plan (VIP) Administrator

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- o Consolidated Fund Campaign
- o The employee directly. (S)

Maintenance to the master file is batched , keypunched and hash totals reviewed prior to actual processing by the system. An update program is run that performs additional editing functions such as format checks, code validations against the master file's allowable codes, and balancing type routines. The update processing routines provide over 20 maintenance reports to assist compensation personnel in monitoring at a detailed level all changes made to the master file. The system of update controls with respect to this file is a critical key to the integrity of the payroll system. (C)

#### 1.1.2.3 Final Review/Corrections (U)

During normal circumstances, most employees work a regular scheduled tour of duty, accrue set rates of leave and are paid a constant amount for long periods of time without any changes. However, between 15-25 per cent of Agency employees will require some type of special handling or pay/leave adjustments during any given pay period. While most of these adjustments are relatively simple, some can be quite confusing and complex. This module is where the current system handles the special cases encountered. (C)

The types of special adjustments handled covers a variety of cases and combination of cases. Some cases are handled in an automated manner while others require some degree of manual intervention. A brief set of illustrative examples is provided:

- o Amended T&As
- o Sick leave advance requests
- o TDY post differentials
- o Hazardous duty pay
- o Moving expense claims
- o Suggestion awards, etc., etc. (S)

Trained payroll technicians become directly involved in the pay and leave adjustment process. They must spend considerable time in completing various input documents to submit for final payroll system processing. This direct intervention is approaching unacceptable limits. (S)

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1.1.2.4 Pay Computation (U)

This module consists of numerous computer programs that actually compute the earnings, deductions and allowances applicable to each employee. This is accomplished by using master file data, validated T&As, and pay/leave adjustment inputs. The process consists of two broad functional steps: 1) base hours to gross pay, and 2) gross pay to net pay. The appropriate distinctions are made between taxable and non-taxable pay. The entire process is controlled and closely reviewed. (U)

1.1.2.5 Reporting/History (U)

Historical information is maintained in six general areas. They are as follows:

- o Savings bond history
- o Federal and state tax history
- o Comprehensive year-to-date history
- o Retirement systems history
- o
- o Leave history. (S)

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These areas are not exclusive in that they are simply different summarizations of the same extensive data maintained in the system's master file. In addition, normal input validation, update, and summarization type reports are routinely produced in every payroll cycle. (S)

1.1.2.6 Actual Payments (U)

Net pay entitlements are produced on magnetic tapes for EFT and Treasury checks respectively. Treasury's production of Agency salary checks is performed at that installation on a prearranged schedule. (S)

1.1.2.7 Year-end Processing (U)

Among the year-end processes are the various tax reports and employee W-2 forms. In addition, processing occurs for separation pay cases and initializations for running totals prior to the start of the next year's cycle. (S)

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#### 1.1.4 CIARDS OVERVIEW (U)

The present CIARDS system was established in 1968. Its overall purpose is to pay former employees who have retired under the Agency's retirement system. (U)

The basic functions of CIARDS are very similar to those of the Biweek system except that CIARDS is much simpler by comparison. Several notable points concerning CIARDS are listed below:

- o Annuitants are paid in amounts that are relatively stable and fixed.
- o A distinction is made between non-taxable equity and taxable amounts paid.
- o Deductions are typically limited to insurance and credit union matters.

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- o Cost-of-living adjustments are periodically factored in at one time for all annuitants. (U)

#### 1.1.5 JPRS OVERVIEW (C)

JPRS overall purpose is to pay independent contractors who perform foreign language services, primarily translations, for the Agency. (U)

The basic functions of JPRS are very similar to the Biweek system. By comparison, JPRS is a simpler system. Several notable points concerning JPRS are listed below:

- o The system only pays independent contractors.
- o Year-end tax reporting is done through a manual interface with the General Accounting System.
- o Contractors are paid on a monthly basis, typically on a "piecework" basis.
- o Checks are prepared manually. (C)

#### 1.2 THE FUTURE ACIS SYSTEM (U)

The basic functions and desirable features of the current payroll systems will serve as a starting point for the future ACIS system. ACIS will differ from the current systems in two significant and broad areas that can be summarized as follows:

- o A variety of new features will be provided that will increase the overall effectiveness of the Agency's compensation system.
- o There will be an increase in the overall efficiency in the administration, operation, and query capability of the compensation system. (U)

A specific area of change will be the manner in which T&A data is entered into the biweek system. Instead of the essentially manual approach now used, this process will be automated to the maximum extent feasible consistent with external regulatory requirements. (U)

Another area of change will be the manner in which information is made available to operational personnel and management. An extensive query

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capability will be provided to enable rapid satisfaction of user's information needs as they arise. (U)

A third area of significant change will be the manner in which changing requirements and user's needs affect the system. The new system will incorporate top-down structured code and modular design concepts to facilitate future modifications and enhancements. Users will thus find ACIS to be an extremely flexible system. (U)

Because of the comprehensive scope of the project, resource constraints, and users' needs for system improvements, a staged project development approach will be adopted. The system functions therefore will not all materialize simultaneously, but rather be sequentially introduced. (U)

### 1.3 PROJECT OBJECTIVES (U)

The overall objective of the project is to enhance the ability of the Office of Finance to perform its mission of financial support to Agency components, particularly in the area of payroll processing. This will be primarily accomplished by providing the Office of Finance with a comprehensive, state-of-the-art automated compensation and management information system. Related project subobjectives are as follows:

- o Improve the productivity of Compensation Division by automating the payroll functions to the maximum extent feasible.
- o Provide comprehensive information to Management concerning the payroll function.
- o Provide this information in a timely and, where appropriate, instantaneous manner.
- o Reduce the present high level of demand upon the Office of Data Processing for data entry services and system modification requests.
- o Enhance information available to Management by interacting automatically with other financial systems, where feasible.
- o Provide a capacity for readily meeting future demands for growth and enhancements. (U)

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#### 1.4 POTENTIAL CONSTRAINTS (U)

The purpose of this subsection is to identify in general terms problems or potential problems as they are detected on the planning horizon that may impact the ACIS project. The intent is to identify problems as early as possible so that they may be obviated or the system design modified, as appropriate. (U)

In addition to satisfying the requirements needed by Compensation Division to effectively operate the Agency's compensation system, ACIS must also satisfy the requirements of other interested entities, some of whom are external to the Agency. Potential problems could arise in that some of these entities may have conflicting requirements. (U)

The General Accounting Office (GAO) prescribes requirements for financial systems operated within the Executive Branch. One requirement that impacts the ACIS system is the current provision that all T&A type documents must be approved by an appropriate supervisory level person. This must be done before these documents can be forwarded for processing and any payments made to employees. A problem arises in that this effectively requires supervisors to physically sign the T&As, and for the signed hardcopies to be physically retained after payroll processing is completed. It would probably be more efficient to enter the T&A data in a purely electronic form, but some manner of hardcopy entry may have to be substituted in order to fully comply with GAO's requirement unless a waiver could be obtained. (U)

Another area concerns the nature of the ACIS interface requirements. As is the case with the current system, ACIS will have to interface with over 10 other Agency systems. Some of these interfaces will be manual, but most will be automated. Two of the larger systems with which ACIS will interface are the General Accounting System (GAS) and the Integrated Personnel Management System (PERSIGN). Given that automated interfaces have the potential of significantly complicating systems development, and to the extent that present or future systems may impose unique or arcane interface requirements in order for ACIS to effect a complete interface, certain design tradeoffs may have to be made. At present, no significant problems have been detected, and none are presently expected. (U)

An additional area of potential impact concerns the staged delivery approach discussed briefly in Section 1.2. The three primary factors that require a staged approach are:

- o Resource availability
- o Compensation Division's needs

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- o Scope of the project. (U)

To the extent that any or a combination of these factors significantly changes, the staged delivery schedule may have to be appropriately adjusted. (U)

#### 1.5 PROJECT DEVELOPMENT OPTIONS (U)

There are currently three options that can be foreseen for the development of the ACIS system. The three options are to develop the ACIS system (1) using personnel in-house (staff or staff/contract), (2) using an outside contractor to deliver the total system, or (3) by purchasing an existing commercial payroll package and having it tailored to our specific needs. The types of resources available to develop ACIS will be decided upon by 2 October 1981 after which time one of the above three options will be selected for ACIS. (AIUO)

Each of these three options are considered within the PDP whenever it is deemed that they have a significant impact. In particular Sections 2, 4, and 10 show the alternate plans as they affect the development cycle; test and evaluation; and resources, deliverables, and schedule respectively. (AIUO)

#### 1.6 SCOPE (U)

This document is organized into the following ten major sections:

- o Section 1, "Introduction", presents the purpose and scope of the ACIS Project Development Plan.
- o Section 2, "Project Development Cycle", describes the set of sequential phases that constitute the project methodology. ACIS will be completed by progressing through these various phases over the life cycle of the project.
- o Section 3, "Organization and Responsibility", describes the various organizations involved in the development of ACIS. The roles and functions of each are identified.
- o Section 4, "Test and Evaluation", describes the various levels and types of ACIS product testing used to ensure that all system components meet the required specifications.

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- o Section 5, "Quality Assurance", describes the project quality control program, and how it will function as an ongoing, independent subgroup organized to ensure that proper software engineering practices and standards are followed.
- o Section 6, "Documentation", describes the formal documents to be produced in support of the ACIS system development, implementation, and operation.
- o Section 7, "Training", identifies the specific areas and the manner in which members of the project development team will be trained to facilitate the development effort. User training requirements will also be addressed to ensure that they understand how to operate the ACIS system.
- o Section 8, "Reviews and Reporting", discusses the set of formal and informal review procedures and appropriate control points needed to ensure a smooth and continuous process of system development progress.
- o Section 9, "Installation and Operation", describes in greater detail the procedures by which the system will actually be installed and implemented.
- o Section 10, "Resources, Deliverables, and Schedule", summarizes the personnel staffing required to develop and implement ACIS. Data Processing factors are discussed, and a detailed near-term schedule that identifies the timing of ACIS deliverables is also provided. (U)

#### 1.7 APPLICABLE DOCUMENTS (U)

The following is a list of the formal ACIS documents produced to date:

- o ACIS Project Development Plan dated 2 July 1981. (U)

#### 1.8 PDP DOCUMENT MAINTENANCE (U)

This document is intended for use by ODP management. The document will be revised periodically to ensure that the information it contains is the most current possible. The document will not be placed under ACIS configuration control. (U)

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Written comments, corrections, and suggestions are welcome and should be addressed to:

ACIS Project Manager  
ODP/Applications/"C" Division



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This document is intended for limited distribution. Requests for copies may be sent to the above address. (U)

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## 2. PROJECT DEVELOPMENT CYCLE (U)

The project development methodology to be used to develop the Automated Compensation and Information System (ACIS) is briefly discussed in the following paragraphs. As previously mentioned alternate cycles are shown based upon whether ACIS is developed in-house, by a contractor, or by tailoring a commercial payroll package. This decision is driven by availability of resources which will be determined by 2 October 1981. Regardless of the option selected, the development cycle of ACIS will follow an orderly set of discrete phases each having a defined goal, set of deliverables, and completion point. These logical breakpoints are called milestones or baselines and are useful in measuring progress, determining quality, and ensuring sufficiency of the resulting system. The reviews that are scheduled at each of these milestones are discussed in Section 8.1. (U)

The Project Initiation and Requirements Definition Phases are (a) common to all the options; (b) occur between project start on 23 March 1981 and the resource decision point on 2 October 1981; and (c) consist of the following:

### A Project Initiation Phase (U)

The Project Initiation Phase lays the groundwork on which the project is to be developed. This phase defines the project development cycle to be followed and the controls to be placed upon the development cycle (Project Development Plan-PDP). (U)

In addition to the production of the PDP, other activities to be performed in this phase are:

- o Organize and staff an ACIS project group within "C" Division/ODP including personnel from both ODP and OF.
- o Determine the budget requirements.
- o Establish a working relation with the audit staff of the Inspector General's Office to identify and resolve critical issues concerning system integrity, security, and auditability.
- o Inform all affected parties/offices of ACIS plans. (U)

### B Requirements Definition Phase (U)

The Requirements Definition Phase determines the functional requirements to be satisfied by ACIS. The major output of this phase is the Functional

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Requirements Document (FRD) which also forms the basis for the contractor Request For Proposal (RFP) if required. Sources for this document will include the following:

- o Request for change enhancements submitted for the current payroll systems that for various reasons will not get incorporated.
- o Descriptions of the functions performed by the current payroll systems as found in design, development, and current systems documents.
- o Interviews with other personnel including OF staff/users of the current systems. (U)

In addition to the Functional Requirements Document (FRD), requirements must be determined for system interfaces (e.g., PERSIGN), database elements and structure, communications, and hardware. (U)

## 2.1 IN-HOUSE DEVELOPMENT CYCLE (U)

This cycle assumes that the system is developed in-house, whether by staff only or staff augmented with contracted expertise. Under either of these staffing plans the following phases apply. (AIUO)

### 2.1.1 DESIGN PHASE (U)

The System Design Phase provides the analysis, design, and review processes necessary to determine the hardware and software structure that can best satisfy the user's requirements. (U)

The major products of this phase are the Preliminary System Design Specifications and System Design Specifications. The ACIS project team will be responsible for preparing the Preliminary System Design Specification and the Detailed System Design Specification. (U)

Two reviews will be performed for the customer in the System Design Phase: the Preliminary Design Review (PDR) and the Critical Design Review (CDR). The project team will be responsible for the preparation and presentation of these reviews. (U)

Upon completion of the Critical Design Review (CDR), any changes to the system design will follow the procedures outlined for Configuration Control. (U)

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### 2.1.2 PROGRAMMING AND UNIT TEST PHASE (U)

All programming, unit testing, and program documentation will be done by a development group under the ACIS project management team. The programs will be documented internally and externally according to standards described for ACIS Configuration Control. (U)

### 2.1.3 INTEGRATION AND SYSTEM TEST PHASE (U)

All testing performed after the software has been turned over following unit testing will be done by a separate test team. The purpose of testing is to independently assess whether the product fulfills/meets objectives. A detailed discussion of Integration and System testing may be found in Sections 4.1.2 and 4.1.3. (U)

### 2.1.4 ACCEPTANCE TEST PHASE (U)

The acceptance test phase within the system development cycle is designed to demonstrate to the customer that the system satisfies his requirements as originally specified. Acceptance testing is discussed in Section 4.1.5. (U)

### 2.1.5 INSTALLATION AND OPERATION PHASE (U)

This phase of the project cycle will address the installation of the new system in a production like environment, the conversion from the current system to the new, and the daily operation and maintenance of the new system. Depending upon the quality of the system developed and the type of data formats required, the conversion effort could either become a large effort (i.e. a mini-project) or be a small effort. If conversion is a large effort, it will be planned in detail, and be accomplished in phases similar to those of the ACIS project as a whole.

## 2.2 CONTRACTOR OR COMMERCIAL PACKAGE CYCLE (U)

The phases for ACIS system development assuming a contractor developed system or a commercial payroll package are basically the same. Either option is assumed to produce a complete system which must be verified as to how well it satisfies the requirements. On-going monitoring will be performed during the life cycle up to delivery to the government. The following two phases will then be performed at that point. (AIUO)

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2.2.1 INSTALLATION PHASE (U)

This phase of the project cycle will address the installation and parallel testing of the system on Agency computer systems and any related modifications/additional testing required. It will also address the conversion of existing data files. This effort will most likely be considerable, and the contractor will be expected to employ a methodology to ensure the successful accomplishment of this phase. (U)

2.2.2 ACCEPTANCE TEST PHASE (U)

The acceptance test phase is designed to demonstrate that the system performs according to specifications and satisfies the functional requirements. (U)

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### 3. ORGANIZATION AND RESPONSIBILITY (U)

#### 3.1 ACIS USER ORGANIZATION (U)

The ACIS system is being developed for the Office of Finance (OF) to aid them in carrying out their charter of developing and maintaining an Agency financial system to reflect and report on the status, use, and accountability for all funds, property, and other assets for which the Director of Central Intelligence (DCI) is responsible. Figure 3-1 displays the organizational structure of OF. The remainder of this section describes the responsibilities of the OF organizations affected in some way by the development of the ACIS system. (C)

##### 3.1.1 OF POLICY AND PLANNING STAFF (U)

The Policy and Planning Staff is responsible for:

- o Assisting and advising the Director of Finance in the day to day management of OF as it relates to policy, planning, systems, and evaluations.
- o Developing and recommending Agency fiscal policies and procedures.
- o Furnishing technical guidance and assistance in all matters of finance and accounting policy.
- o Conducting reviews and evaluations of current and proposed finance and accounting systems to ensure integrity and currency. (C)

##### 3.1.2 OF COMPENSATION DIVISION (U)

Compensation division is the primary customer for the ACIS system. ACIS will be designed and developed to aid them in providing overt and covert payroll activities for Agency personnel. This includes: (1) the issuance of W-2 forms, (2) year end reports consistent with unique Agency cover arrangements, and (3) ad-hoc queries related to Agency compensation activities. (C)

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**OFFICE OF FINANCE**

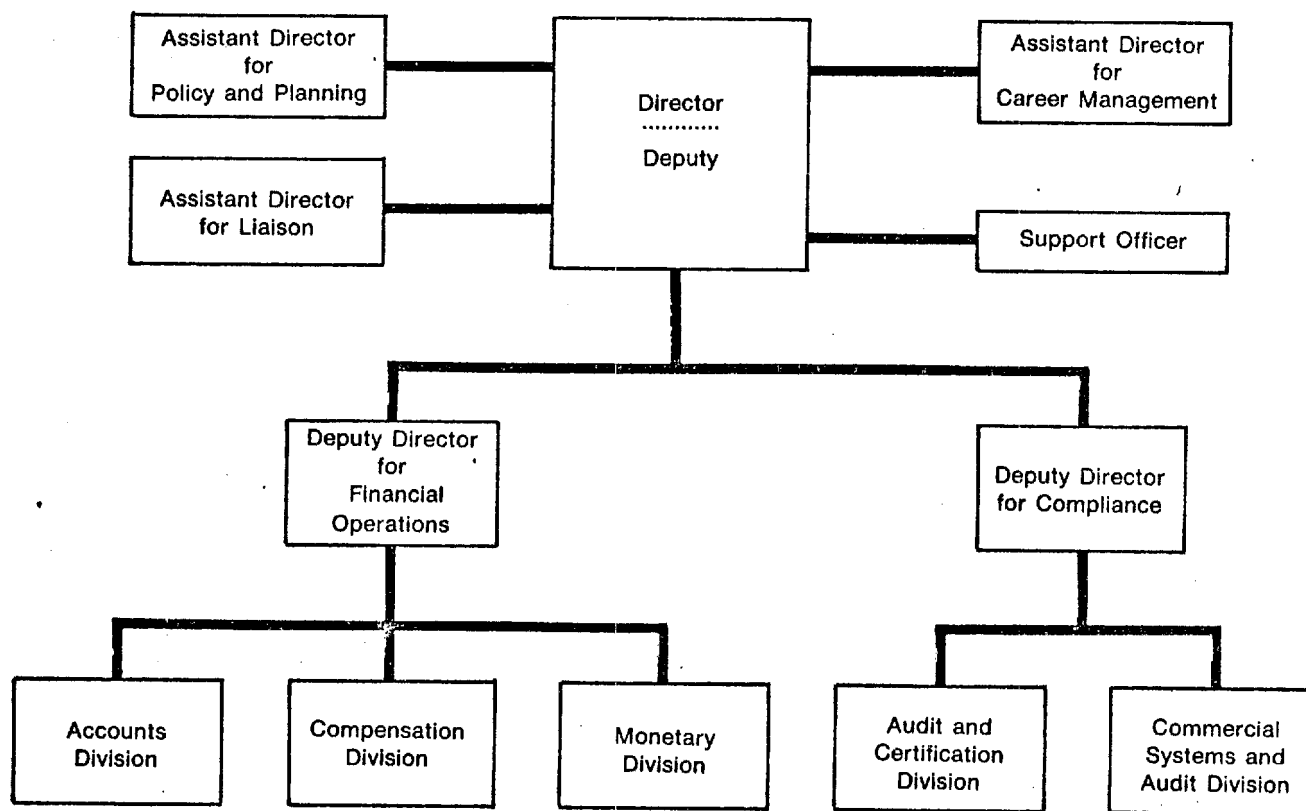


FIGURE 3-1

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### 3.2 ACIS PROJECT ORGANIZATION (U)

The ACIS project is within "C" Division of Applications, under the Office of Data Processing (ODP) within the CIA Directorate of Administration (DDA). Figure 3-2 displays the organizational structure of the DDA. Figure 3-3 displays the organizational structure of ODP. (U)

#### 3.2.1 "C" DIVISION (U)

The Chief and Deputy Chief of "C" Division have responsibility for:

- o Management review of the ACIS project
- o Approval authority over the ACIS configuration
- o Preparation and revision of the annual ACIS Resource Package
- o Reporting to the Deputy Director of Application, Director of ODP, and the Director of OF on the status of the ACIS Project Development Schedule and on long range planning and budgetary considerations as they relate to ACIS
- o Intra-office and inter-office/directorate coordination support as required by the ACIS project. (U)

#### 3.2.2 ACIS PROJECT GROUP RESPONSIBILITIES (U)

The ACIS Project Group is responsible for the development of the ACIS System.

The ACIS Project Manager will be responsible for:

- o Management of the group
- o Review of all ACIS plans
- o Progress tracking of all ACIS activities
- o Budget support and financial controls
- o Prioritizing ACIS tasks within schedule constraints
- o Reporting ACIS activities to the Chief, C Division and senior Agency management

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**DIRECTORATE OF ADMINISTRATION  
OFFICES**

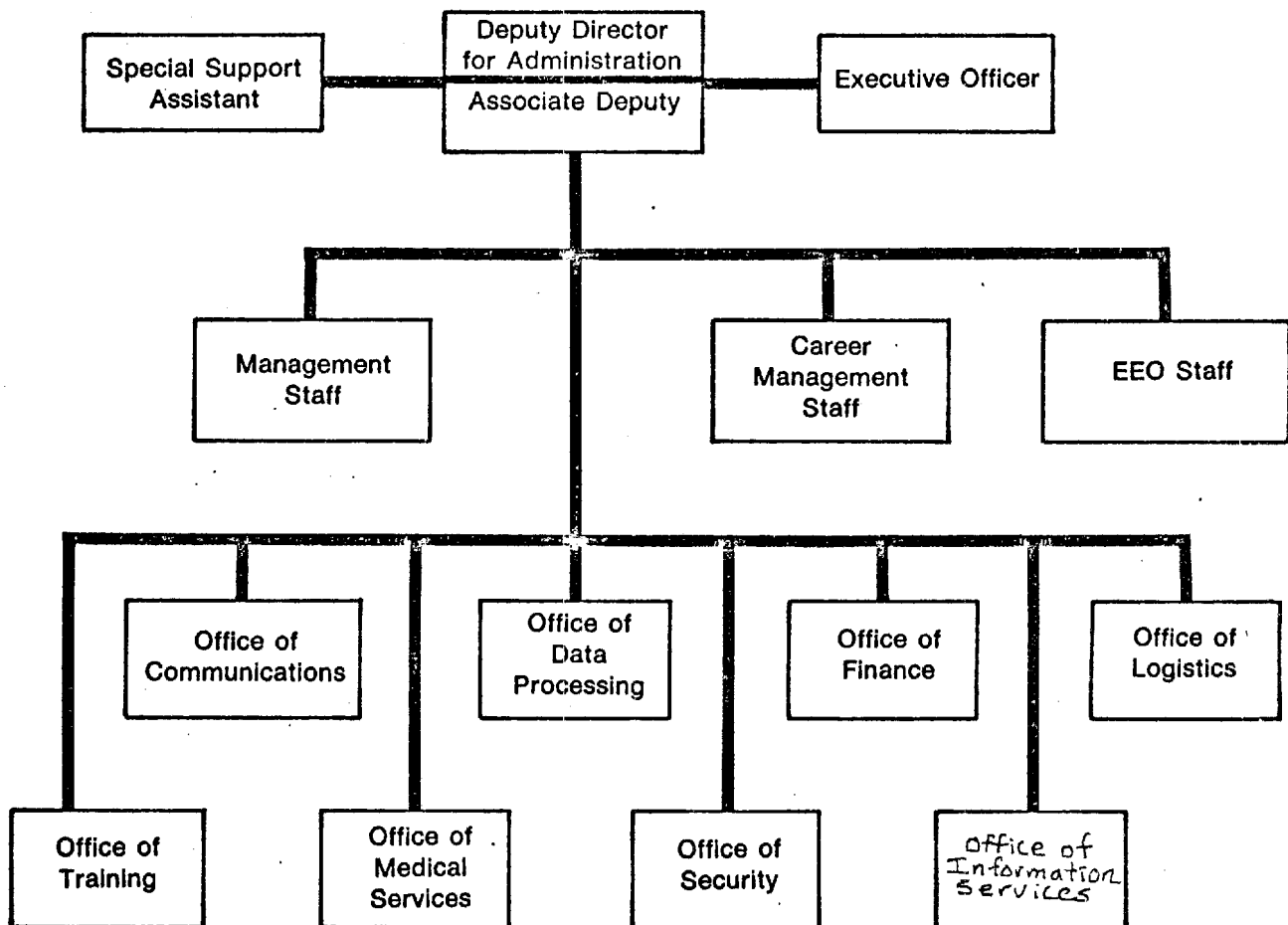


FIGURE 3-2

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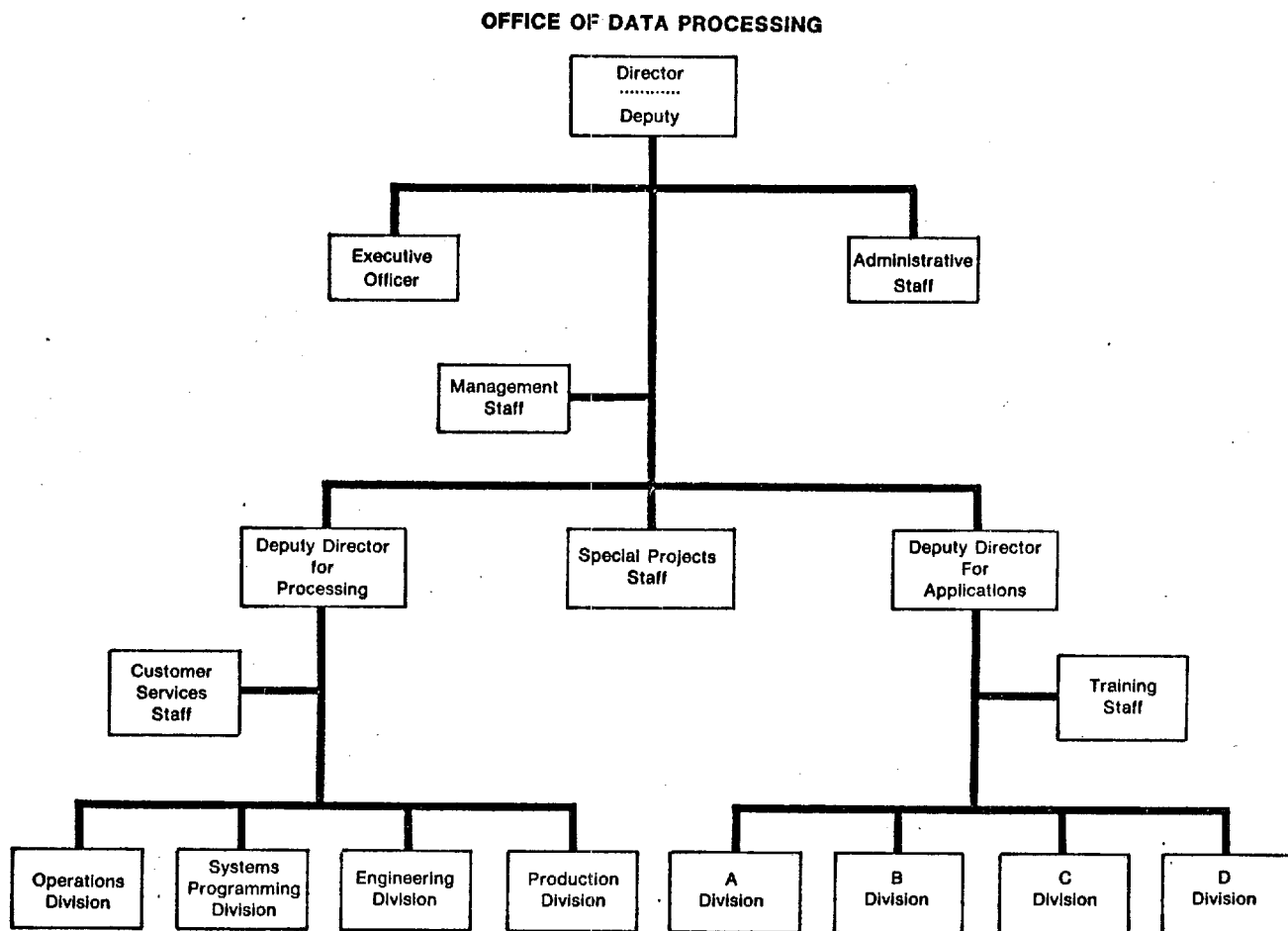


FIGURE 3-3

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The ACIS Project Group will be responsible for some or all of the following functions consistent with the development option selected:

a. Requirements and Analysis

- Data collection
- Analysis of current processes and activities
- Technology versus requirements tradeoffs
- Feasibility studies (if necessary)
- Preliminary estimates
- Preliminary cost justification
- Preliminary system design

b. Systems Development

- Hardware analysis and recommendations
- Commercial software analysis and recommendations
- Database design
- Detailed system design
- Communications analysis and recommendations
- Programming and unit testing
- Program and system level documentation
- Conversion and transition

c. System Testing

- Testing tools generation
- Integration testing
- System testing
- Performance testing
- Test plan, specification, and procedures generation
- Test reporting

d. Quality Assurance

- Configuration Management
- Audits/Independent Verification and Validation
- Coordination of external interfaces to ACIS
- Documentation control
- Resource management
- Software library management
- Release management
- ACIS central library management. (U)

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3.2.3 ACIS DEVELOPMENT AUTHORITY (U)

The management responsibility for the development, maintenance, and operation of ACIS rests with the Office of Data Processing (ODP) in response to requirements levied by the Office of Finance. Within ODP, project responsibility has been assigned to the ACIS Project Manager within "C" Division of Applications. (U)

3.3 ACIS SUPPORTING ORGANIZATIONS (U)

ACIS will be designed, developed, and implemented completely internal to the DDA and as such will obtain support as determined necessary from within ODP and other DDA components. (U)

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#### 4. TEST AND EVALUATION (U)

Software Test and Evaluation (T&E) is a continuous and integral part of the development process. Its objectives are:

- o To ensure compliance with all design requirements and constraints.
- o To ensure the adequacy and correctness of the software products (i.e. evaluating the product's performance).

This process will apply to all baseline software products developed for the production systems.

The goal of software testing is software that meets the requirements as stated. Close coordination is essential between the developer and the tester throughout the life cycle of a software item to ensure the development of test cases that thoroughly exercise new and modified software.

Software testing consists of the following five phases. Each phase has specific organizational responsibilities.

- o Unit Testing
- o Integration Testing
- o System Testing
- o Interface Testing
- o Acceptance Testing

As software passes from one test phase to another, the test results and documentation will be reviewed for accuracy and completeness. (U)

#### 4.1 IN-HOUSE TEST & EVALUATION

##### 4.1.1 UNIT TEST (U)

Unit testing is defined to include:

- o Proving accuracy of computations.
- o Showing repeatability of results.

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- o Testing upper, lower, and nominal ranges of data values.
- o Verifying data handling characteristics under normal and adverse conditions.
- o Thoroughly exercising every new or changed routine of every module and function within a computer program.
- o Verifying the proper transmission of data between routines, modules, and functions within a computer program, i.e., interfaces.

Unit testing is the responsibility of the development group, and will be accomplished by the programmer who develops or modifies a particular software program. Test data may be provided by the programmer, or data may be used which has been accumulated by the development organization in a unit test data pool. Identification of tests conducted and copies of test results will be retained and become a part of the test documentation for the program. (U)

#### 4.1.2 INTEGRATION TEST (U)

The objective of integration testing is to verify the interfaces between programs as specified in the design specifications. The responsibility for integration testing rests with the independent test group.

Integration Testing is defined to include:

- o Verification of proper interface between programs which either depend on the output of other programs or which share data sets or data.
- o Verification of satisfaction of requirements placed on the interaction of functions between programs by the System Design Specification.

Integration testing will be conducted from the test software libraries or test database(s), using as far as possible a standard set of self-contained baseline test cases. (U)

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#### 4.1.3    SYSTEM TEST (U)

The objective of system testing is verification of the system's performance and functional capabilities to meet the stated requirements as traceable from the FRD. The responsibility for system testing rests with the independent test group.

System testing includes the following activities:

- o    Following the flow of data into the system.
- o    Tracking the data through the major pathways of the system.
- o    Verifying the data output by the system.

System testing will be conducted from the test software libraries or test databases, using a standard set of self-contained baseline test cases as far as possible. (U)

#### 4.1.4    INTERFACE TEST (U)

Interface tests and demonstrations will be conducted between the system and all external systems with which it communicates. The purpose of these tests is to verify the compatibility of the communication interface between the system and the sending and receiving parties as well as the correctness of the data transferred. The responsibility for planning, coordinating, scheduling, and conducting these tests rests with the independent test group supported by the customer as required. These tests can occur for a product that is in the system test phase. Successful completion certifies that the interface is correct. (U)

#### 4.1.5    ACCEPTANCE TEST (U)

This phase of testing will validate test cases and test data which have been developed in conjunction with the customer. The responsibility for planning and insuring the completion of acceptance tests rests jointly with project personnel from OF and ODP. The responsibility for conducting, analyzing, and documenting acceptance tests rests with the customer. (U)

#### 4.2    CONTRACTOR OR COMMERCIAL PACKAGE T&E (U)

Since the ACIS system will be delivered as a complete unit under these options the test and evaluation will consist of acceptance testing to

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ensure that the system performs as required. The responsibility for conducting these tests will rest with OF and ODP. (U)

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## 5. QUALITY ASSURANCE (U)

The goal of Quality Assurance (QA) is to assure overall system quality with respect to usability, reliability, maintainability, testability, and accountability. QA ensures that the product being designed and developed satisfies the following:

- o The product meets user requirements during each stage of the system development cycle.
- o The requirements are traceable from conception through the cycle to final product delivery.
- o The product meets specified performance criteria.
- o The product is developed in a logical, coherent manner and conforms to existing standards and procedures. (U)

The objectives of QA are addressed through the following methodologies:

- o Configuration Management (CM)
- o Audit/Independent Verification & Validation (IV&V)
- o Test & Evaluation (T&E)
- o Standards and Procedures

The following sections define the detailed QA to be followed for the in-house development option. If one of the other two options is selected, these QA criteria would be looked for in the development methodologies of the contractor and would be applied once the product is installed on Agency computer systems. Test and Evaluation has been described in Section 4. and the others are described in the following paragraphs. (U)

### 5.1 CONFIGURATION MANAGEMENT (U)

Configuration Management (CM) is a discipline which applies technical and administrative management to the identification and documentation of the characteristics of an item; controls changes to those characteristics; records and reports the status of change processing and implementation; and conducts audits to verify conformance to specifications, drawings, and documents. (U)

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#### 5.1.1 CONFIGURATION MANAGEMENT BENEFITS (U)

The application of configuration management provides the following tangible benefits:

- o It provides visibility of the entire data processing system and its up-to-date status for planning and costing purposes.
- o It limits expenditure of resources to authorized changes in the software or interrelated system elements.
- o It provides a basis for computer software test planning and test design, leading to maximum software reliability and performance.
- o It reduces the problem of integrating software with equipment, personnel, operations, and facilities.
- o It improves the basis for system management of the entire software development process.
- o It improves the accuracy, currency, and completeness of the approved documentation which describes the computer program end item.
- o It provides visibility of the entire system for evaluating the effect of proposed changes to the software or to other interrelated systems and interfacing systems. (U)

#### 5.1.2 CONFIGURATION IDENTIFICATION (U)

Configuration identification is the process of defining and documenting the configuration of a system or another end item throughout its life cycle. The first step in this process is the identification of the Configuration Item (CI). CIs are an aggregate of equipment or computer programs that satisfy an end-use function and are designated for configuration management. The configuration of each CI is documented through the use of specifications and other design documents. This documented configuration becomes the baseline for the CI and the basis for configuration control and status accounting. (U)

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### 5.1.3 CONFIGURATION CONTROL (U)

Configuration control is the systematic evaluation, coordination, and approval or disapproval of proposed changes to any baseline. Formal control of the configuration of an item or system begins with the definition and approval of a baseline for the item and continues through completion of the life cycle. Subsequent to the approval of a baseline for an item or system, all changes to that baseline must be proposed in the form of a Request for Change (RFC). These RFCs are formally reviewed and approved or disapproved by a Configuration Control Board (CCB). (See Section 5.1.5 for further detail on the CCB.) (U)

### 5.1.4 CONFIGURATION STATUS ACCOUNTING (U)

As a result of the configuration identification and control, an item's configuration is identified and changes to that configuration are proposed, evaluated, and implemented. Keeping track of the configuration identification and its changes and reporting this information are the functions of a CM tracking system. (U)

The following two major types of status accounting documents are produced by the CM tracking system:

- |                       |   |
|-----------------------|---|
| CONFIGURATION LISTS   | These lists define the current approved configuration of an item in terms of its elements or identification documents and its approved changes. |
| CHANGE STATUS REPORTS | These reports give the implementation status of changes to a configuration item. (U)  |

These status accounting documents provide implementing personnel and management with visibility and traceability of baseline configurations and their changes. They give implementing personnel the means to coordinate the many actions that must be performed in support of changes, and they give management the means to determine if change decisions are being implemented as directed. (U)

### 5.1.5 CONFIGURATION CONTROL BOARD (U)

Configuration control is the process by which changes to software, documents, and products are initiated, evaluated, approved or disapproved, implemented, verified, released, and documented. This process, which

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provides controlled updating of the evolving system configuration, assures complete analysis of changes that affect cost, schedule and design. (U)

The Configuration Control Board (CCB) has responsibility for configuration control, is chaired by ODP with OF in attendance, and includes the following functions:

- o Review, evaluation, and approval or rejection of proposed changes to the configuration which address the following subjects:
  1. The establishment of and subsequent changes to baseline documents.
  2. The current production system software.
  3. The hardware environment and system software.
- o Consideration shall be given to the desirability of the change and the benefits to be derived from it; its impact on current users, current schedules, and cost; its administrative or technical necessity; and feasible alternatives such as a workaround procedure if the change is not approved.
- o Establishment of the final priority assigned to a proposed change. This includes the opportunity to readjust the priorities of outstanding non-scheduled change requests at the beginning of each scheduling period. (U)

#### 5.1.6 CONFIGURATION AUDITS (U)

Configuration audits are formal comparisons of the configuration identification against the configuration items (CI) which it depicts. Configuration audits are normally required for each developed CI or developed modification to a CI. There are two types of configuration audits, functional and physical. The Functional Configuration Audit (reference paragraph 5.1.6.1) is concerned with whether the CI will perform as intended. The Physical Configuration Audit (reference paragraph 5.1.6.2) is concerned with whether the CI physically matches the final "as built" documentation. In hardware development, these two audits are accomplished at different times; however, in software development it is feasible to accomplish both audits at once. (U)

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5.1.6.1 Functional Configuration Audit (FCA) (U)

A FCA verifies that the performance achieved by the product during validation testing (unit, integration, and system testing) is the performance required by the development specification. If integration and system testing are necessary to fully verify a product, the FCA is not completed until that time. The Project Manager or designee is responsible for conducting a FCA as required to obtain formal customer signed acceptance of software products and documentation. (U)

5.1.6.2 Physical Configuration Audit (PCA) (U)

A PCA verifies that the configuration achieved in the product is accurately specified in the product specification and thereby establishes the product baseline. Preliminary reviews of computer operator's manuals, program maintenance manuals, and any similar document also are conducted at a PCA; formal acceptance of these manuals usually is withheld until system testing. The Project Manager or designee is responsible for conducting a PCA as required to obtain formal customer signed acceptance of products and documentation. (U)

5.2 AUDITS/INDEPENDENT VERIFICATION AND VALIDATION (IV&V) (U)

The purpose of Audit/IV&V is to verify that the following criteria are being met:

- o The project/system is technically valid.
- o The objectives are clearly stated.
- o The requirements are satisfied and are traceable.
- o The system satisfies the intent of the originator (i.e. sufficiency).
- o The project/system complies with existing standards and procedures.
- o The project/system has adequate CM and T&E.
- o Security practices are observed.
- o The project/system is complete, consistent, and unambiguous. (U)

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The types of items covered in the Audit/IV&V process are documentation; software (applications & system) and hardware; interfaces; transition; training; etc. A formal Audit/IV&V should occur at each of the milestones/baselines. On-going Audit/IV&V functions occur throughout the project life cycle. (U)

### 5.3 STANDARDS AND PROCEDURES (U)

A set of standards and procedures are required to ensure that independently developed elements of a system have a common basis, appear to have been developed as a whole, and are easily maintained. These standards and procedures will cover the following areas:

- o Software
- o Documentation. (U)

There are three major reasons for adopting a set of standards and procedures:

- o To develop a product that is characterized by high degrees of reliability, readability, and maintainability.
- o To promote practices that aid in the consistent and orderly development of the total system within schedule and budgetary constraints.
- o To meet the system design specifications. (U)

The methodology to be used for developing ACIS software will be that of top down design/development, program modularization, and structured flow (sequential control). The developers will utilize the software development tools of structured walk-throughs, programming standards, code reading, and unit testing in the development of all ACIS software. The Project Manager or his designee will be responsible for seeing that these tools are used effectively. (U)

The methodology to be used for developing ACIS documentation will be to define outlines for each unique document. These outlines will be followed by all authors to ensure document consistency, readability, and completeness. The Project Manager or his designee will be responsible for seeing that these tools are used effectively. (U)

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## 6. DOCUMENTATION (U)

The following documents should be produced during the project cycle by either the in-house ACIS project team or by the contractor if procured as a system. Automated documentation techniques such as SCRIPTX will be used if ACIS is developed in-house for the following documentation where appropriate. The ACIS Library will be the repository for these documents. The presence of "(CC)" in the descriptions below imply that the document will be placed under Configuration Control. (U)

### 6.1 REQUIREMENTS DOCUMENTATION (U)

- o ACIS Project Development Plan - summarizes immediate and long term plans for ACIS development.
- o ACIS Functional Requirements Document - user requirements on which ACIS will be designed. (CC)
- o ACIS Master Data Elements List - list of all data elements for ACIS together with descriptions and formats. (CC) (U)

### 6.2 DESIGN DOCUMENTATION (U)

- o ACIS Preliminary System Design Specification - initial description of the overall system design alternatives; includes design and implementation cost estimates, resource requirements, development milestones, and test specifications. (CC)
- o ACIS Interface Control Documents - interface specifications between ACIS and other ADP systems (e.g. PERSIGN, CENCO, etc.). Depending on the size of the interface descriptions, they may be included as an integral part of the design specifications. (CC)
- o ACIS System Design Specifications - detailed description of the overall system design; includes functions and flow, performance requirements, file specifications, and test procedures. (CC) (U)

### 6.3 PROGRAM DOCUMENTATION (U)

- o ACIS Program Manual - detailed documentation on all system software; contains complete program/database level documentation needed to perform maintenance on the operational software. (CC) (U)

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6.4    TEST DOCUMENTATION (U)

- o    Test Plans - specify the purpose, goals, and overall description of the testing to be performed and the schedule for completion. (CC)
- o    Test Specifications - provide a detailed description of what functions/programs are to be tested. (CC)
- o    Test Procedures - provide a detailed description of how the tests will be performed and detailed test cases to be executed during validation and acceptance testing. (CC)
- o    Test Reports - present observations and conclusions obtained from the execution of the test cases. (CC) (U)

6.5    USER DOCUMENTATION (U)

- o    ACIS User Manual - instructs the user in how to execute ACIS procedures; serves as reference manual for user. (CC) (U)

6.6    OPERATIONS DOCUMENTATION (U)

- o    ACIS Operating Procedures Manual - instructions required for those portions of the system that may require direct intervention of the computer operator (e.g, backup). (CC) (U)

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## 7. TRAINING (U)

### 7.1 OVERVIEW (U)

This section identifies the training activities needed to develop and implement ACIS. Training activities are divided into two broad categories: 1) project team training, and 2) user training. Project team training will be required to develop and deliver a quality system, and will be conducted during the initial and middle phases of the project. User training will be needed to help users acquire an understanding of and maximum effectiveness from the new system. User training will be concentrated in the latter phases of the project. (U)

The two subsections that follow will provide detailed information on the areas for which training will be conducted within each of the two broad categories just discussed. The training required, scheduled dates for training, and other relevant information will be provided as this information becomes known. Since much of this information is subject to change, the information provided below can be considered up-to-date only as of the date shown on the cover sheet to this Project Development Plan. (U)

### 7.2 PROJECT TEAM TRAINING (U)

At least four areas may require some degree of formal training. These areas are payroll design, database management systems, the COBOL computer language, and hardware familiarization courses.

#### 7.2.1 DESIGN COURSE (U)

Courses are offered that present optimum design information that has been collected during the development of commercial payroll systems. This type of data is invaluable and will be made available to the ACIS project team. The course selected is American Management Association's "Automated Payroll Systems Design Course" to be attended on 26-28 October 1981. (AIUO)

#### 7.2.2 DBMS TRAINING (U)

ACIS will employ some type of database management system and it will be necessary for certain members of the project team to have the requisite DBMS skills. At present, the type of DBMS to be used has not yet been determined, and thus training details are not yet defined. (U)

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### 7.2.3 COBOL TRAINING (U)

There are a number of payroll application packages available on the commercial software market. If one of these packages is selected for use with ACIS it will most likely require some degree of COBOL training since most of the commercial packages are written in COBOL. (U)

### 7.2.4 HARDWARE FAMILIARIZATION (U)

It is possible that ACIS may require certain hardware or other specialized equipment to satisfy user requirements. To the extent that this is necessary, some form of hardware familiarization training will be required, most likely to be provided by the vendor. (U)

## 7.3 USER TRAINING (U)

Three probable areas of user training can be identified at this point. These are T&A input procedures, database update procedures, and database query procedures. These areas provide a starting point and will be considerably expanded at the appropriate time. These areas are briefly discussed below. (U)

### 7.3.1 T&A PROCEDURES (U)

These procedures will be changed considerably when ACIS is delivered. In addition to the operating personnel in Compensation Division, approximately   T&A clerks throughout the Agency will have to be trained in the new input procedures. This will pose a logistical problem of some magnitude that will have to be effectively addressed prior to implementation. (U)

### 7.3.2 DATABASE UPDATE (U)

ACIS will probably utilize a database management system in lieu of the current file structures. While functionally similar, update and maintenance procedures will be significantly different. This will require retraining of user personnel. (U)

### 7.3.3 QUERY (U)

A query capability will be a new feature of the ACIS system. Training will have to be provided in order for the user to take full advantage of the powerful capabilities that this feature will offer. (U)

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## 8. REVIEWS AND REPORTING (U)

Reviews and reports constitute checkpoints at which progress on a project may be evaluated. At each of these checkpoints a defined set of information is made available for review and evaluation by project internal management and/or the customer. Completion of a scheduled review is visible evidence that a given milestone was achieved. Reporting records project activities, plans, and problems together with whether the milestones are achieved behind, ahead of, or on schedule. (U)

Section 8.1 below lists the reviews that are planned for the ACIS project and Section 8.2 lists the levels of reporting planned together with the type and frequency of the reports. (U)

### 8.1 REVIEWS (U)

#### 8.1.1 FORMAL REVIEWS (U)

##### 8.1.1.1 Functional Requirements Review (U)

The purpose of the functional requirements review is to review the problem specifications, system and data requirements, and project development plan to determine the readiness to commence the system/project design, development, and implementation. This review is an on-going process during the definition phase that culminates with a formal review among the customer and the developing organization. The approved functional requirements become the baseline for the preliminary design. They are placed under configuration control. (U)

##### 8.1.1.2 Preliminary Design Review (PDR) (U)

The purpose of the Preliminary Design Review (PDR) is to review the Preliminary System Design Specifications (PSDS) and the Test Specification Document to determine the readiness to progress to the Detailed Design Phase. The PDR ensures that all requirements are included in both documents and that both documents agree on the requirements. Critical dates for the exchange of information and/or data between the interfaces are established. An informal review including the designer, the programmer, and the tester should be held prior to the formal review. The formal review will include the customer, project management, the designer, the programmer, and the tester. The customer and project management must

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approve the PSDS and the Test Specification Document. Both documents will be placed under configuration control. (U)

#### 8.1.1.3 Critical Design Review (CDR) (U)

The purpose of the critical design review is to review the System Design Specification (SDS) and the Test Procedure Document to determine the completeness and adequacy of the baseline design and the readiness to progress to the code phase. Software design is presented to demonstrate compliance of the design to the requirements. Test procedures are presented to ensure that all test specifications are included. An informal review should be held prior to the formal review and includes the designer, programmer, tester, and those project personnel who are technically competent to verify the design. The formal review includes the above persons as well as project management and the customer. The customer and project management must approve the System Design Specification Document and the Test Procedure Document. Both documents will be placed under configuration control. (U)

#### 8.1.1.4 Code Review (U)

The purpose of the code review is to review each module to ensure compliance with the System Design Specification and to verify that established programming standards are met. The review includes the designer, a senior programmer, the programmer who did the coding, and a programmer from the independent test group. (U)

#### 8.1.1.5 Unit Test Review (U)

The purpose of the unit test review is to review the unit test results and program documentation to ensure readiness of the software to be passed to the test team. The review process includes the programmer, tester, and applicable project managers. (U)

#### 8.1.1.6 Integration/System Test Review (U)

The purpose of this review is to review the integration/system test results to ensure that the software was tested in accordance with the Test Procedure Document. The review includes the tester and applicable project managers. (U)

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8.1.1.7 Acceptance Test Review (U)

This review will be conducted by the customer to review acceptance test results to ensure that the software satisfies their requirements as originally specified. (U)

8.1.1.8 Post-Mortem Review (U)

The purpose of this review is to review the software development methodology to determine areas for improvement. The review is a critical analysis of the project and is held after the software has become operational. The review includes the designer, programmer, tester, project management, and customer. (U)

8.1.2 INFORMAL REVIEWS (U)

Informal reviews may be held at any point within the development cycle. Attendees at such reviews will usually consist of project personnel and outside experts as required by the review.

The informal review techniques utilized should include:

- o Peer review
- o Structured walkthroughs

The responsibility for scheduling an informal review and establishing the list of attendees resides with the Chief of the organization involved or with the Project Manager as appropriate.

Reasons for holding informal reviews include the following:

- o To determine whether a proposed design meets the design requirements.
- o To determine whether the proposed method of implementation is optimal.

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- o To consult with people who may have additional insight into the problem and its solution.
- o Develop solutions for a given problem. (U)

8.2 REPORTING (U)

8.2.1 OFFICE OF FINANCE REPORTING (U)

OF analysts will be members of the ACIS project team and therefore it is assumed that OF will be kept informed of project status by these analysts. In addition, formal briefings of project status have been scheduled for the Directors of Data Processing and Finance to be given at their regularly scheduled monthly meetings. (U)

8.2.2 OFFICE OF DATA PROCESSING REPORTING (U)

Each Office of Data Processing (ODP) Division must prepare a weekly activity report. ACIS activities will be included in the "C" Division Weekly Report. All Division reports are consolidated into a single Applications Division report for the Director of ODP. In turn, the Director/ODP prepares a report for the DD/A. (U)

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9. INSTALLATION AND OPERATION (U)

9.1 SYSTEM INSTALLATION PHASE (U)

Project personnel will be responsible for installing the operational version of the ACIS software and performing the required data conversions and initializations necessary to ensure that the ACIS system is consistent with the systems it replaces. (U)

9.2 SYSTEM OPERATION PHASE (U)

"C" Division/ODP will manage the development and maintenance support to the application software. "C" Division will provide a maintenance chief who will be on call around-the-clock and who will be responsible for resolving ACIS system problems. The functions of the maintenance chief will be to identify the source of system problems as they occur, determine the severity of the problem, contact that individual who can resolve the problem, and follow up on the solution to the problem. (U)

Production Division/ODP will monitor system activity, run production jobs for the users, and execute utilities such as database backups and restorations. (U)

Pay Administration Branch/Compensation Division/OF will be the users' point of contact for all ACIS system activities. The ACIS Data Base Administrator will be a member of the Pay Administration Branch. (U)

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10. RESOURCES, DELIVERABLES, AND SCHEDULE (U)10.1 PERSONNEL (U)10.1.1 SKILLS AND EXPERIENCE FOR IN-HOUSE DEVELOPMENT (U)

The skills and experience levels required for successful in-house development of ACIS change as development progresses through distinct phases. Between each phase there is a period of overlap during which the skills of both phases are required. Section 2.1 of this document describes the types of activities to be performed in each development phase. The following is a list of skills and experience requirements for each:

- o During the Project Initiation (Section 2.1.1) and Requirements Definition (Section 2.1.2) phases the primary skills required are systems analysis, requirements analysis, and project management. Underlying these skills is the need for both broad and deep experience in developing computer system requirements, and the writing skills to document and express these requirements. Secretarial support is required, especially in the area of word processing.
- o During the Design phase (Section 2.1.3) the skills required are systems analysis, system design, and project management. A detailed state-of-the-art knowledge of computer systems architecture and software engineering is mandatory. A limited amount of programming support will be needed for analysis, simulation, and testing to validate design decisions. Secretarial support is required, especially in the area of word processing.
- o During the Programming and Unit Test phase (Section 2.1.4) the skill level needed is a mix of intermediate to senior level programmers and system designers. Project Management skills are also required, as is secretarial and word processing support.
- o The Integration and System Test phase (Section 2.1.5) effort requires a mix of intermediate to senior level software testers and administrators. Project management skills are also required, as is secretarial and word processing support.

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- o The Acceptance Test phase (Section 2.1.6) effort also requires a mix of intermediate to senior level software testers and administrators. Project management skills are also required, as is secretarial and word processing support.
- o During the System Installation and Operation phase (Section 2.1.7) the amount of programming skills required decreases and the amount of integration skills increases. Otherwise, the same types of skills as Programming and Unit Test (Section 2.1.4) are required.

#### 10.1.2 SKILLS AND EXPERIENCE FOR CONTRACTOR OR COMMERCIAL PACKAGE PROCUREMENT (U)

The skills and experience levels required for successful procurement of a complete system are different from those required for a system developed in-house. For this case a great deal of monitoring of the contractor is required up until delivery. This requires senior level Systems Analysts and Contract Monitors and Administrators. Project management skills are required as is secretarial support. The acceptance test and installation phases require skill mixes as mentioned under these headings in Section 10.1.1 above. (U)

#### 10.1.3 STAFFING SCHEDULE (U)

During the Project Initiation (Section 2.1.1) and Requirements Definition (Section 2.1.2) phases the ACIS team will consist of senior managers from C Division/ODP and the Policy and Plans Staff/OF. Secretarial support will also be required. Additional staffing plans are contingent upon the development option selected. (U)

#### 10.2 DATA PROCESSING ENVIRONMENT (U)

The ACIS system development and operation will require the use of Agency computer systems. The details cannot be adequately determined at this time however it is probable that VM plus a mainframe CPU using PL/I and a DBMS language will be required. (U)

#### 10.3 SCHEDULE (U)

The ACIS near term schedule (until 2 Oct. 1981) is presented below.

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- o FRD 2 Oct 1981
- o Analyses 2 Oct 1981

The impact of the three development options makes it undesirable to propagate the schedule further than 2 Oct. 1981 at this time. (U)

10.4 DELIVERABLES (U)

- o ACIS Functional Requirements Document, to be published in DRAFT form on 2 October 1981.

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